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ABSTRACT

Based on the work of the New Jersey Networking Infrastructure in Education (NJNIE) project, it has been demonstrated that thoughtful integration into the curriculum of Internet-based resources has enormous potential to improve teaching and learning. "The Alliance for Training K-12 Teachers in Instructional Technologies: A National Internet-in-Education Teacher Training Program," combines and builds upon two types of outreach programs initiated in New Jersey: partnering with community colleges to provide teacher professional development, and developing turnkey trainers or "mentor teachers" to become staff developers in their schools/districts. The Alliance aims to provide professional development equivalent to a 30-hour graduate course to a minimum of 2,400 teachers in three cities (Cleveland, Miami, and Phoenix) through a network of local organizations utilizing exemplary curriculum materials and a turnkey training approach. The workshop series includes: (1) introduction to using the Internet; (2) the Internet as a communications tool; (3) collaborative projects; (4) real-time adventures on the Internet; (5) identifying and integrating compelling World Wide Web sites into the curriculum; (6) strategies for finding educational Web sites and searching for information; (7) unique resources for social science and language arts; (8) creating a school Web site; (9) classroom management and training strategies; and (10) final presentations. (AEF)

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Starting a Community-Wide Internet Turnkey Training Program for K-12 Teachers

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Starting a Community-Wide Internet Turnkey Training Program for K-12 Teachers

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President Clinton's 1996 State of the Union address stressed the need for access and teacher development on applications of the Internet: "Our challenge is to provide Americans with the educational opportunities we'll all need for this new century. In our schools, every classroom in America must be connected to the Information Superhighway with computers and good software and well trained teachers" (President Bill Clinton, Jan. 23, 1996). His May 1996 announcement of the "21st Century Teachers" initiative set a goal to train 500,000 teachers in the use of innovative educational technology tools such as Internet-based resources (President Bill Clinton, May 29, 1996).

With movements such as Net Day helping to wire classrooms and the explosion in Internet connectivity in American homes and schools, more and more teachers, parents, and students are learning to "surf the net." Yet, little happens to actually change the way teachers teach and students learn without: carefully-crafted curriculum materials that meaningfully integrate compelling Internet-based resources; a long-term view of professional development that takes into account content, pedagogical, and assessment issues as well as technical mastery; and ongoing support for schools by organizations able to keep pace with the dynamic rate of change in the technologies themselves. One observer notes that teaching teachers how to surf the 'Net and expecting them to create wonderful Internet-based curricula is akin to teaching someone word processing and asking him or her to write a textbook. Experience demonstrates that using Internet in the classroom, without thoughtful preparation, structured lesson plans, a sound foundation in the content discipline, carefully-considered classroom management strategies, and detailed assessment strategies, often is a time waster for students and teachers alike.

How, then, can schools and school systems prepare their teachers and students with the capability to utilize this remarkable resource in ways not possible with traditional tools? How can teachers capture the power of this technology to engage students, to involve them in interdisciplinary explorations that stress content as well as collaboration, critical thinking, and mastery of information technology tools? And, above all, why pursue the expense and investment of time necessary to help teachers become proficient with Internet technology and integrate it into the curriculum?

Based on work at Stevens Institute of Technology over the last three years through a National Science Foundation-sponsored grant (the New Jersey Networking Infrastructure in Education project or NJNIE), it has been demonstrated that thoughtful integration into the curriculum of Internet-based resources has enormous potential to improve teaching and learning. We've taken the approach that the Internet should be considered a "value-added" classroom resource; that is, one which empowers teachers to pursue activities not possible with other tools or strategies. We contend that, where another medium will suffice, a CD-ROM, a piece of software, or even a textbook, it makes little sense for schools to undertake the expense, technical difficulty and the teacher development required to successfully use the Internet.

For example, a sixth grade class might study whales. With an Internet connection, a teacher could have students go to any number of whale web sites to look at pictures of whales, find "whale facts," and even listen to a whale song. Yet this same exploration could just as easily have been conducted using a textbook, audiocassette or CD-ROM. However, the Internet can bring a distinctive advantage, beyond these other educational tools, to this study if it is used to acquire "real time" data on where the whales migrate. Students can track, through the Journey North (Journey North, 1997) and WhaleNet (Welcome to WhaleNet, Nov. 29, 1997) web sites, the migration patterns of whales in the spring and fall and see actual daily movements of whales by plotting their position using data from satellite transponders with which the animals have been tagged. They can combine this migration data with real time data on concentrations of phytoplankton in the world's oceans which comes from the SeaWIFS project web site[1](SeaWIFS Project, 1997). Using this new data they can link the whale's migration to its feeding grounds which are indicated by high concentrations of plankton, the whale's

primary food source. All of this work can be guided by a marine biologist who may reside thousands of miles away but who can be in contact with the students using email. Clearly, these classroom experiences cannot be created using CD-ROMs, software packages, or textbooks because of the inherent static nature of these resources.

In the NJNIE project, we have observed that the Internet has a singular advantage in those explorations which can't be accomplished using traditional tools: where access to "real time" data and information enlivens the study of traditional topics (like looking up the location and magnitude of the earthquakes and volcanoes that have occurred within the last 24 hours around the world and plotting them on a map); where global collaboration with other students and content experts provide opportunities for student involvement in a real scientific exploration (like measuring the boiling point of water with students and scientists in Miami, Mexico City, and Mt. Everest and discovering how altitude affects the boiling point, or emailing a marine biologist to answer a question about seals that the teacher doesn't know); and where an interdisciplinary approach not possible with traditional tools can be facilitated by this technology (like a global water sample project in which students compare the microorganisms found in pond water in cities in New Jersey, South Africa, Japan, and England, and discover through email exchanges what life is like in those faraway places). See the NJNIE web site at *http://k12science.stevens-tech.edu* for more information on these actual projects.

These projects and other unique and compelling applications of the Internet which utilize "real time" dynamic data and global collaboration to model, predict, and discover geographical and cultural differences have been the foundation of all the teacher professional development and curriculum initiatives in the NJNIE project. With $2.9 million in NSF funding and additional corporate support, NJNIE has reached 3,000 teachers from 700 schools in New Jersey. Because our partner schools see this focus on data as a compelling reason to undertake Internet connectivity and teacher professional development, we have been overwhelmed with requests from schools for workshops and collaborations.

For this reason, we sought to find opportunities for multiplier effects. Our new project, "The Alliance for Training K-12 Teachers in Instructional Technologies: A National Internet-in-Education Teacher Training Program," combines and builds upon two types of outreach programs initiated in New Jersey: partnering with community colleges to provide teacher professional development, and developing turnkey trainers or "mentor teachers" to become staff developers in their schools and districts. We see the Alliance partnership program as a viable model that can be implemented in communities in every state in the U.S*It presents a method for schools and school systems to provide wide-scale staff development in content-based applications of Internet technology and to bolster their staff development resources through collaboration with community colleges.*

The Alliance aims to provide professional development (equivalent to a 30-hour graduate course) to a minimum of 2,400 teachers in three cities over three years through a network of local organizations utilizing exemplary curriculum materials and a turnkey training approach to staff development. We believe that this model is both replicable and scaleable, and can be initiated in additional cities with local corporate and foundation support. Educational Testing Service of Princeton, NJ will evaluate the efficacy of this model and its impact on strengthening and institutionalizing partnerships between schools and community colleges as well as its impact on the extent to which teachers and students make substantive and effective use of Internet-based resources in the classroom.

The Alliance project is funded with a seed grant of $909,000 from the U.S. Department of Education over three years. Started in fall 1997, the Alliance seeks to demonstrate a "proof of concept" working with local organizations in Cleveland, OH, Miami, FL, and Phoenix, AZ. Project partners include: Stevens Institute of Technology, which has developed the curriculum materials and packaged them into 10 three-hour "hands-on" workshop modules, and which will be providing support and guidance on the workshop series, curriculum, and development of the mentor teachers; the League for Innovation in the Community College, a consortium of the country's largest and most pioneering program-oriented community colleges, which will collaborate with the three community colleges to initiate and sustain school-college collaborations; and Thirteen/WNET, the flagship station of the Public Broadcasting Network, with extensive experience in educational programming, which has provided video documentaries of classroom applications of the Internet in instruction.

The community colleges selected for this demonstration phase, Cuyahoga Community College (Tri-C) in Cleveland, Miami-Dade Community College, and Maricopa Community College in Phoenix, are all members of the League for Innovation with a strong technological infrastructure and extensive experience collaborating with their neighboring K-12 schools. In each city, different strengths and conditions exist. The Alliance program aims to build on existing collaborations and overlay a set of exemplary curriculum materials that can be adapted to local needs. The model also fosters the support mechanisms to initiate and strengthen collaborations between partner schools and community colleges.

In the fall of 1997 during the project's organizational phase, Stevens and the League met with local leadership in the three cities (including school superintendents, district-level science and technology coordinators, and staff developers, as well as community college presidents, vice presidents, faculty and other administrators). At these meetings, partners shared detailed information about

existing K-16 collaborations, current local technology and staff development initiatives, and the needs and challenges of implementing the Alliance model. In each city, a strong focus by school districts on curriculum-oriented Internet professional development combined with recertification movements have rapidly moved the Alliance model forward.

In January 1998, core teams from each city met at Stevens Institute of Technology in New Jersey for a one-week institute. This intensive institute provided a detailed orientation to the 10-part workshop series, feedback and discussion about specific local needs and adaptations, and models for ongoing support and institutionalization of these new modes of collaboration and professional development.

10-Part Workshop Series

- Introduction to the Using the Internet - Getting Online for a Reason
- Internet as a Communications Tool - Using Email in your Classroom
- Collaborative Projects - Linking up Around the World
- Real Time Adventures on the Internet
- Identifying and Integrating Compelling Web Sites into your Curriculum
- Strategies for Finding Educational Web Sites and Searching for Information
- Unique Resources for Social Science and Language Arts
- Creating a School Web Site
- Classroom Management and Training Strategies
- What Have We Learned? Final Presentations

Between January and June 1998, each community college, serving as the locus of activity for that city's initiative, will provide professional development to teams of between 20 and 40 K-12 mentor teachers. These mentor teachers will participate in 10 three-hour hands-on workshop in order to prepare to begin giving workshops in September 1998. During the fall 1998 term, the community college teams will support the mentor teachers (working in teams of two) as they provide staff development to 200-400 colleagues. In this model each team of two mentor teachers will present the 10 part course to 20 teachers. In the next cycle (spring 1999), the community college core team will reach out to another group of mentor teachers, and then support them the next term in their outreach to their colleagues. At the conclusion of this three-year project, it is expected that each city will have provided staff development equivalent to a 30-hour graduate course for a minimum of 800 teachers.

The advantages of this model are obvious: it build upon local strengths and infrastructures that already exist and provides a mechanism for institutionalizing partnerships between community colleges and K-12 schools (given the rapid rate of technological change, this is of particular appeal to schools); it builds capacity within schools by creating mentor teachers who can serve as school-wide and district-wide staff developers; it puts Internet training in the context of sound curriculum applications which have been created with practicing teachers and which are keyed to national content and technology standards; and it satisfies a variety of local needs for recertification and graduate credits for teacher professional development.

Though the benefits of this initiative are clear, the Alliance model is not without challenges. In fact, the special strengths of this model—the ability to forge new relationships between community colleges and schools, the involvement of a variety of stakeholders in planning and implementation, and the use of school-based mentor teachers to provide quality ongoing staff development—also make this a complex and formidable program to implement. Particular care has been taken to involve all the appropriate school and district-level administrators in planning meetings, and their input and feedback has been sought at every stage of implementation. Selection criteria for the community college core team and for the initial group of turnkey trainers/mentor teachers has been developed, and district administrators are choosing these representatives as much for their leadership and motivational potential as for their content background and their technological proficiency. And an ultimate measure of the success of this project will be the extent to which classroom teachers are able to and enthusiastic about using Internet-based resources in the classroom. This requires districts to support the mentor teachers and the classroom teachers as they begin implementing Internet-based lessons in their classrooms. It will require them to rethink how they evaluate teaching and learning. And it will require schools to be flexible and adaptive to the constant changes in technology and the changes that the technology catalyzes in the teaching/learning dynamic.

The success of the Alliance model rests on three complex and interdependent elements: (1) exemplary curriculum materials that present applications of the Internet that enhance, enrich, and strengthen traditional lessons and provide opportunities for problem-solving and collaboration not possible with other tools; (2) a collegial, equal, and deepening partnership between K-12 schools and teachers and community college faculty and administrators that helps schools keep pace with and plan for dynamic technological change; and (3) school system support for the mentor teachers, the professional development services they will provide, and experimentation of classroom teachers as they integrate new Internet-supported instructional technologies into their classrooms and lessons.

Much learning has gone into the development of the Alliance model. We expect much more will result from this three-year experiment to capture the best that schools, community colleges, local organizations, and project partners can pool to achieve a national imperative—helping

teachers nationwide to exploit the power that these emerging technologies can offer to enable students to achieve their potential.

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